

**National Academy of Sciences, Engineering, and Medicine**  
**Committee on Seismology and Geodynamics and Its Activities**  
**Final Technical Report**  
**September 23, 2015 to May 31, 2017**  
**Award # G15AC00348**  
**PI: Deborah Glickson**

The descriptions below focus on activities that have been accomplished in the project period September 23, 2015 to May 31, 2017. The award has supported the activities of the Committee on Seismology and Geodynamics (COSG; <http://dels.nas.edu/global/besr/COSG>). This report addresses the following topics:

- Summary
- Status of Activities and Progress During the Award Year
  - Ongoing activities
  - Activities in development
  - Communication and engagement
- Outstanding Issues
- Anticipated Activities for FY2018
- Summary of Expenditures

### **SUMMARY**

The Committee on Seismology and Geodynamics (COSG) is a standing committee under the Board on Earth Sciences and Resources. COSG was formed in 2001 by merging three long-standing committees: the Committee on Seismology, the U.S. Geodynamics Committee, and the Committee on Geodesy. As a standing committee of the Academies, the COSG provides an impartial forum for discussing geophysical issues of importance to federal agencies and scientists and also oversees specialized panels of experts, which carry out scientific studies on issues related to the structure, dynamics, and evolution of the Earth.

COSG is charged with the following tasks:

1. To foster and encourage understanding of the structure, dynamics, and evolution of the Earth;
2. To review and define basic and applied research activities in seismology, geodesy, and geodynamics that contribute to federal agency missions;
3. To address the transfer of seismological and geodynamics knowledge to areas of public welfare and national need including topics such as earthquake science; geological hazards; energy, mineral, and water resources; national security; global climate change; land-use planning; and public education;
4. To foster long-term national efforts to collect, store, and openly disseminate seismological, geodetic, and geodynamical data of all types;
5. To foster long-term national efforts to monitor geodynamical events as well as nuclear testing treaties using geophysical technologies; and
6. To serve as the U.S. member of International Lithosphere Program.

During the award period, the committee oversaw, convened, and facilitated four public meetings, oversaw a consensus study and a meeting of experts, and advanced its public engagement and communication profile. The committee itself was newly reconstituted with an entirely new membership early in 2015. These activities are described below. A short summary of anticipated activities in FY2018 is also provided.

## **STATUS OF ACTIVITIES AND PROGRESS**

### **Committee Membership and Staffing**

Strong committee membership is essential to the successful operation of COSG. These experts serve pro bono for 1- to 3-year terms and are selected to allow the committee to cover the principal disciplines of geophysics and related fields and to bring a diversity of experiences and perspectives to bear on important issues related to the solid Earth. The disciplines generally sought within the committee membership include seismology, earthquake engineering, geodesy, geodynamics, geomagnetics, tectonics, crustal dynamics, mantle dynamics, geology, and mineral physics—as well as associated measurement, modeling, and computational methods. The composition of the committee varies over time, allowing the committee to respond to emerging scientific and policy issues.

The committee members are selected through an annual call for nominations issued by the National Academies staff. This call reaches colleagues in federal agencies, including the committee's sponsors, state agencies, the private sector, academia, and non-governmental organizations. Committee membership is finalized only after composition, balance, and conflict of interest issues have been explored and discussed. In addition to its biannual meetings, the committee generally holds one teleconference call each month discuss existing work and oversight responsibilities, plan meetings, and develop new projects.

A call for nominations in 2013 generated nearly 100 names in core areas of geophysics (e.g., earthquake seismology, geodynamics) and in new areas being explored for potential studies (e.g., volcanology, computational methods). The selection of an entirely new slate of committee members was approved on January 7, 2015. An additional member (geodesy) was added on September 1, 2015. A call for nominations for 1-2 additional committee members (sea level rise, tsunami hazards, geodesy, geodynamics) was sent out on March 13, 2017 and an additional member is expected to be added before the end of 2017. The current committee can be found in Attachment 1.

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### **Public Meetings**

Meetings in this award period have focused on a number of timely topics, including *Spanning the Coastal Zone* (October 2015), *Collaborative Graduate Training Initiatives in High-Performance Computing for the Solid Earth Sciences* (April 2016), a joint Board on Earth Sciences and Resources/COSG meeting on *The Cascadia Subduction Zone: Science, Impacts, and Response* (November 2016), and a business meeting focused on a discussion with sponsors about their needs and interests, as well as a session on communicating the value of geoscience/geophysics to society (May 2017). Please see Attachment 2 for meeting agendas.

At its **Fall 2015** meeting, the group examined *Geophysical Research Challenges Spanning the Coastal Zone*. Three sessions looked at the science of solid earth science across the coastal zone, technological opportunities and challenges, and opportunities for collaboration and coordination. Panelists included government, academia, and industry.

*Meeting outcomes:*

The meeting generated follow-on discussions with several federal agencies in attendance, focused primarily on refining specific themes in this area that could benefit in the future from further examination by a group of the National Academies. The meeting also offered opportunities to begin exploring the subject of the Cascadia subduction zone, which became a theme for one of COSG's 2016 meetings.

At its **Spring 2016** meeting, COSG looked into *Collaborative Graduate Training Initiatives in High-Performance Computing for the Solid Earth Sciences*. A number of challenges in addressing critical solid-Earth science problems relate to the current ability to employ high-performance computing and imaging approaches, ranging from method development in numerical modeling of Earth system behavior on exascale hardware to Big Data analysis and uncertainty quantification to imaging that uses dense, multi-sensor networks. Sustaining a diverse and interdisciplinary scientific workforce is crucial for making progress in solid-Earth science, but the community does not currently have a consistent mechanism or approach in place to develop and maintain that type of training. Three sessions included an overview, case studies, and vision for the future, followed by a breakout session. Panelists included academia, federal labs, and industry.

*Meeting outcomes:*

Subsequent to the meeting, committee members were very active in communicating with colleagues in several national/international groups with significant components that involve HPC (e.g., CIG, CIDER, UNAVCO, IRIS). The purpose of these discussions was to determine if enough interest and resources could be garnered to create a new HPC-Earth Science cooperative program. It appeared that most of the existing groups were already too far along in their new proposals or with current funding to be able to add a new element to their existing portfolios. The committee agreed to continue to think about other approaches to try to address the perceived gap in HPC training initiatives for the solid earth sciences.

At its **Fall 2016** meeting, COSG held a joint meeting with the Board on Earth Sciences and Resources on *The Cascadia Subduction Zone: Science, Impacts, and Response*. Complementing previous symposia and workshops organized by others during the past year, this meeting examined what is known about the science of subduction zones, the nature of the subduction zone hazards and impacts, and how science can be linked effectively to help practitioners, managers, and the public prepare for and respond to earthquake and tsunami events. Three sessions examined the source, impacts from cascading hazards, and preparedness, response, and mitigation. Panelists included federal and state agencies, as well as academia.

*Meeting outcomes:*

BESR/COSG set up a small group of members to develop a series of three webinars to further explore this topic. One was held in the award period (on the source, with speakers Kelin Wang and Joan Gomburg) and was very well-received. In addition to

further exploration of the topic, these webinars were also oriented toward creating a broader awareness of the science of subduction zones and the importance of the Cascadia subduction zone, in particular. The first webinar had 211 attendees, a 58% attendance rate. Approximately 25 science questions were asked during the question and answer period. Attendees were from a variety of sectors, including state and federal government, academia, and industry.

At its **Spring 2017** meeting, COSG took the opportunity to check in with three of the committee's four primary sponsors: USGS, the National Aeronautics and Space Administration (NASA), and the National Science Foundation (NSF). The fourth sponsor, the Department of Energy's Office of Science/Basic Energy Science (DOE-BES), was unable to attend. The discussions were helpful for both the agencies and the committee in reviewing current topics/issues of interest and potential ways in which the committee could be of assistance to the agencies. The meeting also included a discussion with four geoscience professional societies to better understand topics of current interest.

*Meeting outcomes:*

COSG came up with several ideas that are in various stages of development, including a discussion draft of a subduction zone science study and another on the economic costs related to geohazards. NASA discussed its interest in a geodesy workshop, which is also in development.

**Work in Progress or Finished During This Period**

- **Improving Understanding of Volcanic Eruptions:** This study aims to improve understanding of the processes that initiate, sustain, and end volcanic eruptions and the relationships between those processes and observed eruption precursors. Sponsors include NSF, NASA, and USGS. Initially slated to be conducted solely as a workshop instead of a consensus study due to funding constraints on the part of the agencies, the Academies Presidents agreed to provide \$300,000 toward the project, enabling the scope to be broadened to a full consensus study. The study thus began in September 2015 and was released in April 2017. Reception of the report has been excellent from both federal agencies and the volcanology community.
- **Discussion of the National Science Foundation Division of Earth Sciences' Workshop Report on "Future Seismic and Geodetic Facility Needs in the Geosciences": Meeting of Experts:** This short-term project was designed to provide additional input to the NSF's Division of Earth Sciences (EAR) as it prepared to recompile the Seismological Facilities for Advancement of Geoscience and EarthScope (SAGE) and Geodetic Facilities for Advancement of Geoscience and EarthScope (GAGE) programs. The Academies was asked to convene an ad hoc meeting of experts for one day in late October 2015 to review and provide individual expert opinions on the NSF-generated report from the May 2015 NSF workshop held in Leesburg, Virginia, on this topic.
- **Cascadia Webinar Series:** A small group of BESR and COSG members has been spearheading the development of a webinar series based on the Fall 2016 Meeting. The first webinar "Current Science on Earthquake Source and Related Hazards," was held on May 18 and featured Kelin Wang (Pacific Geoscience Centre, Geological Survey of

Canada) and Joan Gomburg (USGS). A recording of the webinar can be found here: <http://dels.nas.edu/global/besr/BESR-Webinar>. There were 211 attendees out of 363 registered, which was a 58% attendance rate (very high, in our experience). Approximately 25 science questions were asked during the question and answer period. Attendees were from a variety of sectors, including state and federal government, academia, and industry. Two more webinars are planned for 2017 (second webinar on "Current Strategies to Mitigate Loss of Life" on August 16, third webinar on emerging technologies to be scheduled).

### **Public Engagement and Communication**

The committee is committed to increase its outreach to and communication with various stakeholders across federal and state government, the private sector, academia, and non-profit organizations. Traditional communication mechanisms used during the award period have included the committee website and study reports and their dissemination. Other mechanisms (through the Board's Twitter account @NASEarth, for example) are also being examined. The committee is also making remote access to its public meetings via WebEx a standard part of its meeting agendas and meeting invitations.

### **OUTSTANDING ISSUES**

Deborah Glickson re-assumed the responsible staff officer (RSO) position from Elizabeth Eide in October 2016 upon her return to the Academies. She had been the previous RSO, until October 2015. No other issues were noted.

### **ANTICIPATED ACTIVITIES FOR FY2018**

Among the activities the committee will continue to facilitate or convene in FY2018 are:

- Two public meetings (November 7, 2017, and another in Spring 2018 – topics to be determined)
- Development of new potential studies on subduction zone science, economic costs of geohazards, and seismological risks related to Yucca Mountain
- Development of a workshop on "Evolving the Geodetic Infrastructure to Meet New Scientific Needs" for NASA.

#### **Proposed Statement of Task**

An ad hoc panel of the Committee on Seismology and Geodynamics (COSG) will organize a workshop to identify key connections between geodesy and priority Earth science questions, and to explore how to improve the geodetic infrastructure to meet new science needs. Topics explored in the workshop include the following:

1. Progress in maintaining and improving the geodetic infrastructure, as detailed in the recommendations in *Precise Geodetic Infrastructure: National Requirements for a Shared Resource* (NRC, 2010), and aspirations for future improvements through, for example, new technology and analysis.

2. Science questions from the 2017 Decadal Survey on Earth Science and Applications from Space (NASEM, expected late 2017) that depend on geodesy, and the connections between these questions, associated measurement requirements, and geodetic data.

3. The elements of these science questions that drive future requirements for the terrestrial reference frame, Earth-orientation parameters, and satellite orbits, and what geodetic infrastructure changes are needed to help answer the questions.

#### **SUMMARY OF EXPENDITURES**

The funds allocated to the committee and its activities were fully utilized and were directed primarily toward staff time in support of the committee's functions.

# THE NATIONAL ACADEMIES

*Advisers to the Nation on Science, Engineering, and Medicine*

Division on Earth and Life Studies

Board on Earth Sciences and Resources

Attachment 1

500 Fifth Street, NW  
Washington, DC 20001  
Phone: 202 334 2744  
Fax: 202 334 1377

## COMMITTEE ON SEISMOLOGY AND GEODYNAMICS

### MEMBERSHIP

(Terms expire 12/31 of the year indicated)

**Richard M. Allen, Chair (2017)**

Director, Berkeley Seismological Laboratory and  
Professor, Department of Earth and Planetary Science  
University of California, Berkeley

**Thorsten W. Becker (2017)**

Shell Distinguished Chair of Geophysics  
Jackson School of Geosciences  
The University of Texas at Austin

**Cynthia Ebinger (2017)**

Marshall-Heape Chair and Professor  
Department of Earth and Environmental Sciences  
Tulane University

**Steven Jacobsen (2017)**

Professor  
Department of Earth and Planetary Sciences  
Northwestern University

**Lisa Grant Ludwig (2017)**

Professor  
Program in Public Health  
University of California, Irvine

**Stephen R. McNutt (2017)**

Professor  
School of Geosciences  
University of South Florida

**Matthew Pritchard (2017)**

Associate Professor of Geophysics  
Department of Earth and Atmospheric Sciences  
Cornell University

**Maya Tolstoy (2017)**

Professor  
Department of Earth and Environmental Sciences  
Lamont-Doherty Earth Observatory of Columbia  
University

**Jeroen Tromp (2017)**

Blair Professor of Geology and Professor of Applied  
and Computational Mathematics  
Department of Geosciences  
Princeton University

**William R. Walter (2017)**

Research Geophysicist  
Lawrence Livermore National Laboratory

**Sherilyn Williams-Stroud (2017)**

President and CEO  
Confractus, Inc., TerraEx Group, and  
California State University, Los Angeles

**NRC Staff**

**Deborah Glickson**, Senior Program Officer  
dglickson@nas.edu

**Courtney R. Gibbs**, Administrative Coordinator  
cgibbs@nas.edu

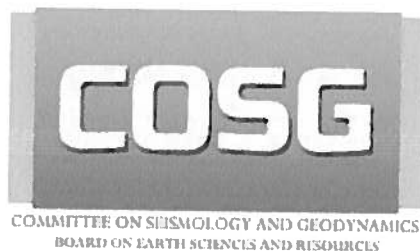
**Nicholas D. Rogers**, Research Associate  
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Attachment 2



KECK CENTER | 500 FIFTH ST NW | WASHINGTON, DC 20001

**GEOPHYSICAL RESEARCH CHALLENGES  
SPANNING THE COASTAL ZONE**

OCTOBER 26, 2015, 08:30 – 15:00

ROOM 201

[HTTP://DELS.NAS.EDU/GLOBAL/BESR/COSG](http://DELS.NAS.EDU/GLOBAL/BESR/COSG)

**AGENDA**

More than two-thirds of Earth's surface is covered by oceans and large lake basins, making ocean floor, lake bottom, and subsurface observations critical to understanding planetary processes. Commercial and socioeconomic resources are also heavily invested in shore and coastal areas: according to the National Oceanic and Atmospheric Administration, in 2010, 39% of Americans lived in counties directly on the shoreline, with the number expected to grow by 8% through 2020. For many of these areas and for coasts around the world, data are lacking to constrain predictive models for the response of these shorelines to rising sea-level and increasing storm intensity. Most shorelines do not represent tectonic or geological boundaries, but rather reflect present-day sea level. While recent surveys of territorial waters conducted for the Law of the Sea provide deep crustal imaging of the ocean-continent boundary, no comparable experiment studies the critical coastal zone and most mapping and experiments stop at the shoreline. Thus, fundamental mapping of major crustal structures, sedimentary basins, active faults, and eruptive centers that occur in the coastal zones has been limited, owing to technological challenges associated with making seafloor geophysical measurements. Likewise, the research communities that study these processes remain, in large part, compartmentalized as "land" and "marine".

Please indicate your attendance in person to Courtney Gibbs ([cgibbs@nas.edu](mailto:cgibbs@nas.edu)). Access to the meeting via web/tele-conference is possible using the links provided at the end of the agenda.

**OVERARCHING MEETING OBJECTIVE**

Identify key challenges in conducting geophysical research that crosses the shoreline, exchange information about how to answer the three overarching questions below, and strengthen ad hoc inter-agency communication to facilitate common goals.

**Presenters and members of the audience will be asked to consider the following questions during the meeting:**

- 1) What are currently the most pressing solid Earth science questions and applications that span the lake/ocean and land boundary? What are their implications to infrastructure and society?
- 2) What technology and coordination innovations are required to address these questions and applications? Which innovations, development, and training are already underway or in development, and which face significant challenges to succeed over the next decade (allows for questions of who is in training)?



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- 3) Which near-term opportunities might help scientists continue to conduct fundamental and applied research in the coastal zone, and what could be done to increase collaboration among the research and application community? What could be done to increase participation in, and support for, these fundamental science questions?

**MONDAY, OCTOBER 26, 2015**

08:30-15:00

ROOM 201, KECK CENTER

**07:45-08:30**    Closed Session: Committee and staff only

**08:30-15:00**    Open Session: Open to the public

**08:30-09:00**    Registration

**09:00**            Welcome and introductions

**Richard Allen, Chair**  
*Committee on Seismology and Geodynamics*

**09:10**            Keynote presentation

**Anne Tréhu**  
University of Oregon

Questions and Discussion

**10:15-10:30**    Break

**10:30-14:30**    Panel Discussions

Panel Format: Each panelist will speak for ~5-7 minutes about the challenges and opportunities they see with respect to the panel topic and the overarching goals of the workshop; these short comments will be followed by a moderated panel discussion and question period.

**Panel 1 | Solid-Earth Science Crossing the Shoreline**

**10:30**

This panel will discuss the critical solid Earth science questions issues related to understanding geophysical processes that are best addressed by considering both sides of the shoreline in the U.S. and globally.

**SPECIFIC QUESTIONS FOR THIS PANEL TO CONSIDER:**

What currently are the most pressing solid Earth science questions that span the shoreline? What are the major challenges associated with conducting and coordinating such experiments?

**Jennifer Wade**

National Science Foundation, Division of Earth Sciences

**Ben Phillips**

National Aeronautics and Space Administration, Earth Surface and Interior

**Julia Morgan**

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Rice University

**MODERATOR**  
**Matt Pritchard**  
Member, COSG

**Panel 2 | Applications and Technology for  
Solid-Earth Science Beyond the Shoreline**

**11:30**

This panel will discuss the technological opportunities and challenges to apply solid-earth science research to pressing problems crossing the world's coastlines.

**SPECIFIC QUESTIONS FOR THIS PANEL TO CONSIDER:**

What are the latest offshore and nearshore technologies that might enable both large scale Earth Science experiments that span the shoreline and provide societally important data on hazards and/or economically important issues. What are the societal needs in this regard? Which innovations are already underway or in development, and which face significant challenges to succeed?

**Diego Arcas**  
Pacific Marine Environmental Laboratory

**David Nichols**  
Schlumberger

**David Chadwell**  
Scripps Institution of Oceanography, University of California, San Diego

**MODERATOR**  
**Maya Tolstoy**  
Member, COSG

**12:30-13:30**    **Working lunch—everyone welcome**  
-Discuss morning panel  
-Discuss keynote

**Panel 3 | Collaboration and Coordination of Solid-Earth  
Science Research Spanning the Shoreline**

**13:30**

This panel will discuss the challenges and potential solutions to conducting solid-earth science research and applying that research to issues at the world's shorelines.

**SPECIFIC QUESTIONS FOR THIS PANEL TO CONSIDER:**

What are the barriers both internally to agencies and externally to conducting large-scale shoreline spanning

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experiments? How can inter- and intra-agency sharing of facilities and capabilities be smoothed, and what are the best mechanisms for supporting critical facilities across support agencies? What communication, infrastructure, and support networks could be enhanced to increase collaboration and participation among the research and application community?

**Rick Murray**

National Science Foundation, Division of Ocean Sciences

**Bob Detrick**

Incorporated Research Institute for Seismology

**John Haines**

U.S. Geological Survey

**Carol Frost**

National Science Foundation

**MODERATOR**

**Cynthia Ebinger**

Member, COSG

**14:30**

**Wrap-up and next steps**

**Richard Allen**

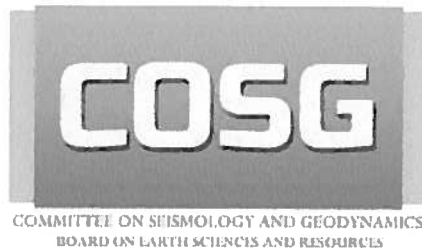
**15:00**

**Adjourn meeting**

**END OPEN SESSION**

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**COLLABORATIVE GRADUATE TRAINING  
INITIATIVES IN HIGH-PERFORMANCE  
COMPUTING FOR**

**THE SOLID EARTH SCIENCES**

APRIL 11, 2016, 09:00 – 16:30, ROOM 206

[HTTP://DELS.NAS.EDU/GLOBAL/BESR/COSG](http://dels.nas.edu/global/besr/cosg)

To attend in person or via webex,

**AGENDA**

A number of challenges in addressing critical solid-Earth science problems relate to the current ability to employ high-performance computing (HPC) and imaging approaches. These approaches range from method development in numerical modeling of Earth system behavior on exascale hardware to Big Data analysis and uncertainty quantification to imaging that uses dense, multi-sensor networks. From a disciplinary perspective, geodesy, seismology, mineral physics, geodynamics, and, importantly, the interfaces between these fields provide the foundation for such research. However, implementation of the research also relies on strong computational skills. Within a single university department, the resources required to provide comprehensive training in HPC are often very difficult to develop and maintain, particularly for small groups of students. These challenges have motivated the solid-Earth HPC community to reassess what multi-year, multi-institution training networks may contribute to addressing ways to maintain this training pipeline. Sustaining a diverse and interdisciplinary scientific workforce is crucial for making progress in solid-Earth science and the community does not currently have a consistent mechanism or approach in place to develop and maintain that kind of training.

Existing initiatives for discipline-specific training of graduate students and post-docs in HPC and imaging include workshops run by IRIS, UNAVCO, CIG, the CIDER summer schools, NSF RCN programs, GeoPRISMS Institutes, Gordon Research Schools, and other short courses. These programs build a cohort of students within disciplines, but the interdisciplinary training and computational components are not consistent and would benefit from expansion. The European International Training Networks may provide a model where existing U.S. programs could be better integrated and leveraged across academia and industry. This meeting seeks to address several related questions to address the problem of training students and graduates in critical HPC and imaging skills for solid Earth science.

Please indicate your attendance in person to Courtney Gibbs ([cgibbs@nas.edu](mailto:cgibbs@nas.edu)). Access to the meeting via web/tele-conference is possible using the links provided at the end of the agenda.

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**OVERARCHING MEETING OBJECTIVE**

The goals of this meeting are to identify shared interests across stakeholders from government, academia, and industry in solid Earth science graduate training for method development with a focus on modeling, imaging, and data analysis using HPC. The meeting will examine the format of current and future training initiatives and best practices, the way in which new initiatives could interface with existing efforts, and novel approaches to sustaining these kinds of efforts.

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**Presenters and members of the audience will be asked to consider the following questions during the meeting:**

- What are the current challenges in high performance computing and method development in the solid Earth sciences?
- Could solid Earth graduate training benefit from, and contribute to, wider efforts in cyberinfrastructure and education?
- Are current educational efforts meeting the demands of academia and industry?
- What mechanisms have functioned well to bring some of this training to students and young professionals in the solid Earth community?
- Could annual or biannual training workshops, or other mechanisms, aligned with multi-year science agendas build a cohesive cross-disciplinary cohort of researchers, and at the same time improve retention in geoscience research and education?

**MONDAY, APRIL 11, 2016**  
**08:45-15:00**  
**ROOM 206, KECK CENTER**

**08:45-15:00**    **Open Session: Open to the public**

**08:45-09:00**    **Registration**

**09:00**            **Welcome and introductions**

**Richard Allen, Chair**  
*Committee on Seismology and Geodynamics*

**Overview / Science highlights**

**09:10-09:55**    15 min talks followed by moderated discussion

**Artie Rodgers** (Lawrence Livermore National Laboratory)  
High performance computing in structural and source seismology

**Renata Wentzcovitch** (University of Minnesota)  
High performance computing in mineral physics and materials science

**MODERATOR**  
Jeroen Tromp, COSG

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**Panel 1 | HPC graduate training: case studies and best practices**

**09:55-10:55** 10 min talks followed by moderated discussion

**Louise Kellogg** (University of California, Davis)  
CIG educational

**Thorsten Becker** (University of Southern California)  
CIDER

**Heiner Igel** (University of Munich)  
(via web conference)  
European ITN

**MODERATOR**  
Cynthia Ebinger, COSG

**10:55-11:10** *Break*

**Panel 2 | Future vision and sustaining mechanisms**

**11:10-12:10** 10 min talks followed by moderated discussion

**Colin Thomson** (Schlumberger, Cambridge)  
(via web conference)  
Needs and challenges for HPC in industry

**Jack Wells** (Oak Ridge National Laboratory)  
HPC for Earth science systems

**Geoffrey Fox** (University of Indiana)  
Education Initiatives: Data Science, Computational Science and Intelligent Systems Engineering:  
What succeeds?

**MODERATOR**  
Bill Walter, COSG

**12:10-13:00** **Working lunch**  
Discuss morning panel  
Plan breakouts

**Breakout session | 13:00 – 13:45**

2-3 breakout groups to discuss

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|  |
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| 1) best practices, 2) future vision, 3) sustaining mechanisms. |
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**13:45-14:30** Breakout reports and discussion in plenary

**14:30-15:00** Wrap-up and next steps

**Richard Allen**

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**15:00-16:30** Informal discussion and exchange among meeting attendees:  
Cascadia and subduction zones: science, hazards and mutual interests

**END OPEN SESSION**

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**Thursday, November 10, 2016**  
**Autumn meeting hosted by**  
**Board on Earth Sciences and Resources and**  
**Committee on Seismology and Geodynamics**  
National Academy of Sciences Building  
2101 Constitution Avenue  
Washington, DC 20418  
Open Session: 10:00 am – 5:00 pm | Room 120

**The Cascadia Subduction Zone: Science, Impacts, and Response**  
**In Person and WebEx Registration via SurveyGizmo**

Geoscience data and information collected over the last 30 years shows that multiple giant earthquakes and associated local tsunamis have struck the Pacific Northwest (including Northern California, Oregon, Washington, and Southwestern British Columbia) for at least the past 10,000 years. The 800-mile Cascadia Subduction Zone (CSZ), which stretches from northern California to southern British Columbia, is the main source of these earthquakes and accompanying tsunamis and has been the subject of extensive research in terms of monitoring and observations, and geologic and geophysical characterization. The science community, government agencies at all levels, state and local managers, industry, and the broader public are eager to gain a better understanding of this major tectonic feature and its potential activity and impacts. This meeting will examine what is known about the science of subduction zones, the nature of the subduction zone hazards and impacts, and how science can be linked effectively to help practitioners, managers, and the public prepare for and respond to earthquake and tsunami events.

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**AGENDA – Open Session 10:00 – 17:00**

**09:30**      **Doors Open**

**10:00**      **Welcome, Introductions, and Expectations**

**Richard Allen and Gene Whitney, Chairs,**  
*Committee on Seismology and Geodynamics and*  
*Board on Earth Sciences and Resources, respectively*

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**10:15-11:00**    **Keynote Presentation:**

**Kelin Wang, Pacific Geoscience Centre,**  
*Geological Survey of Canada*

**11:00-12:15**    **Panel I – The Source: Subduction zone dynamics, earthquakes, and tsunamis**

**Moderator: Maya Tolstoy, COSG member**

- **John Vidale, University of Washington**
- **Chris Goldfinger, Oregon State University**



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**12:15-13:15 LUNCH**

**13:15-14:30 Panel 2 – Cascading hazards: Earthquake and tsunami impacts**

*Moderator: Cynthia Ebinger, COSG Member*

- **Joan Gomberg**, University of Washington/U.S. Geological Survey
- **Eric Geist**, U.S. Geological Survey
- **Tim Walsh**, Washington State Department of Natural Resources

**14:30 BREAK**

**14:45-16:15 Panel 3 – Preparedness, response, and mitigation: Employing science to advance solutions**

*Moderator: Scott Cameron, BESR Member*

- **Yumei Wang**, Oregon Department of Geology and Mineral Industries
- **Rocky Lopes**, National Oceanic and Atmospheric Administration
- **Richard Allen**, University of California, Berkeley
- **Gerald Bawden/Craig Dobson**, National Aeronautics and Space Administration

**16:15 Synthesis and general discussion of the day** *Richard Allen, Chair, COSG*

**17:00 Adjourn Open Session**

## Committee on Seismology and Geodynamics

Spring Meeting  
May 8-9, 2017

Keck Center  
500 5<sup>th</sup> St NW  
Washington, DC 20001

### AGENDA

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Monday, May 8 – Room 206

**CLOSED SESSION – Committee and Staff Only: 8:30 a.m. – 10:15 a.m.**

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|------------|---|---|
| 10:30 a.m. | <b>Discussion with Sponsors and Relevant Federal Agencies</b> <ul style="list-style-type: none"><li>• What are current sponsor interests?</li><li>• What are present and future challenges?</li><li>• Update on important agency activities since last mtg</li></ul>  | <i>Jill Franks and Mike Blanpied, USGS<br/>Ben Phillips, NASA<br/>Jim Rustad, DOE<br/>Greg Anderson, NSF<br/>Rick Murray, NSF<br/>Neil Weston, NOAA</i> |
| Noon       | <i>Working lunch</i>  |   |
| 1:00 p.m.  | <b>Communicating the Value of Geoscience to Society</b> <ul style="list-style-type: none"><li>• How do professional societies go about educating policymakers/public of value of geosciences to society?</li><li>• What efforts are already in place?</li><li>• How does geophysics fit within the broader role of communicating the value of geoscience?</li></ul> | <i>Kasey White, GSA<br/>Maeve Boland, AGI<br/>Liz Landau, AGU<br/>Elizabeth Duffy, Federal Affairs Office</i>   |
| 3:00 p.m.  | <i>Open session adjourns</i>  |   |
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